NORTH DAKOTA STATE UNIVERSITY | SPRING 2008

George T. Gillies Receives 2007 Alumni Achievement Award

George T. Gillies graduated from NDSU in 1974 with a B.S. in Physics. He then earned a M.S. and a Ph.D. from the University of Virginia. Gillies is the co-inventor of fourteen issued patents and the inventor/co-inventor of an additional 50 related patent disclosures. Most of these are in the field of biomedical engineering, several being for the development of innovative catheters used in neurosurgical procedures. While attending NDSU, he served as President of the Blue Key Fraternity and was active in various organizations, including Pi Kappa Delta, Sigma Pi Sigma, Student Senate, Lincoln Debate Society, and the Newman Center.

Gillies' work in the field of physics enabled him to travel worldwide and work at several prestigious organizations, including the International Bureau of Weights and Measures in France, the Cavendish. Laboratory at Cambridge University and the Institute of Physics in Great Britain, at the Institute of Geodesy and Geophysics of the University of Trieste and the International School of Gravitational Physics, in Italy, and universities in St. Petersburg and Moscow, Russia.

Although many have benefited from Gillies innovations in technology, it is his work at the University of Virginia for which he is most noted. His research, together with colloquies and students over th past 20 years, has resulted in the development of several medical instrumentation systems that help doctors treat brain diseases. Among these is a magnetically guided catheter system, which has now been used successfully on thousands of patients. This work has had an important impact on how interventional procedures are carried out in medicine. He is a co-founder of Stereotaxis, Inc. and NexGen Medical Systems, Inc.

George Gillies, a native of Rugby, North Dakota. He and his wife, Melanie, have a grown daughter Olivia, and reside in Charlottesville, Virginia. In his free time Gillies enjoys long distance running, studying modern languages, fishing with his former NDSU Debate Team partners in Wisconsin, and working on his sculpture garden.

College of Science and Mathematics Awards

Dr. Sylvio May, Associate Professor of Physics, has been honored as the 2008 recipient of the College of Science and Mathematics Award for Excellence in Research. Dr. May's research in theoretical and computational biophysics is internationally recognized and has attracted major funding from the National Science Foundation and the National Institutes of Health that is now supporting graduate students and a postdoctoral fellow at NDSU.

Dr. Paul Juell, Associate Professor of Computer Science and 1968 Physics graduate, has been posthumously honored as the 2008 recipient of the College of Science and Mathematics Award for Excellence in Mentoring (see Alumni News). **Dr. Alexander Wagner**, Associate Professor of Physics, also was honored by being nominated for this award by his students.

Department News

Time flies. It's been over a year since our last newsletter, and I would like to thank all of you who have sent us information. This newsletter is our primary vehicle for communicating with our alumni; it is also a convenient venue for you to communicate information about your life, career, and family to friends from your time at NDSU. To those of you who have not already done so, please update us on what you are doing. Recent updates are included in the alumni sections of this newsletter.

As highlighted on the first page of this newsletter, one of our alums, George Gillies, was awarded the 2007 Alumni Achievement Award. During his visit to receive the award, he addressed our algebra-based physics class and provided an interesting chronicle of his career and the challenges of developing and commercializing medical devices. It was a fascinating story.

Other news of interest includes the following:

- The Department is currently completing a search for a new faculty member in Physics Education. This position is one of three new faculty lines allocated to the new STEM-Education doctoral program. We have a number of excellent candidates, and are excited about the prospect of a faculty member with expertise in this area.
- The department held its first annual undergraduate poster session on August 24, 2007. Undergraduates from Augsburg College, Winona State University, and NDSU attended and presented the results of undergraduate research carried out the previous academic year and at various summer REU programs. We intend to continue this event on an annual basis.
- The Department's instructional labs were completely renovated this past summer. These improvements enabled the Department to consolidate lab space and will allow us to introduce a much needed lab component in our Modern Physics course.

Finally, I would like to personally thank all of you who have contributed to one of the Department funds that enable us to recognize outstanding undergraduate scholarship. Further information regarding these funds and scholarships are provided in the body of this newsletter. Please continue to provide support for these scholarship funds. And don't forget, please come by the Department when you are in the Fargo area. We would enjoy showing you around and hearing about your life after NDSU.

This year's graduates

Four Physics Majors will graduate this academic year. Scott Ayash received his BS in Physics last December; he is currently a Graduate Student at the University of North Dakota. Three students, William Huhn, Elliot Johnson, and Ryan Swanson, will graduate in May. Next autumn, William Huhn will be a graduate student at Carnegie Mellon University, and Elliot Johnson will continue his studies at SUNY-Stony Brook.

Patty Hartsoch, long-time Staff Member, Returns

Patty Hartsoch started working in the Department in 1997. After nine years working with "a great group of physicists," she then ventured out of Physics on November 1, 2006. However, after her replacement, Diane Goede was lured away to the Dean's office, she returned, and has been here since January 1, 2008. "The physicists are still a great group to work with," Patty says, "and I'm very happy to be back." That great group of physicists is also happy to have her back.

Lab renovations

The undergraduate laboratory classrooms on the third floor of South Engineering were completely remodeled during the summer of 2007. We are now in the process of "remodeling" the laboratory courses, and re-synchronizing them with the lecture course material; we are also incorporating LON-CAPA (Learning Online Network with Computer-Assisted Personalized Approach) internet-based software into the laboratories. The laboratory manuals have been replaced with online experiment descriptions, which can be instantly updated by the instructor. We are also using LON-CAPA to implement pretests for each lab and to have students upload their lab reports, plot data, and answer questions on their results. After remodeling, we now have 12 lab tables per room, allowing us to accommodate 24 students per section without having more than two students per station. We are adding equipment to accommodate 12 stations per section, replacing obsolete items, and have purchased computers for each lab station. We are also incorporating computer data acquisition where appropriate. Future plans include the addition of a lab component to Physics 350, Modern Physics. Donations for this project would help us achieve this goal. (As a long-term gift, note that companies such as Teachspin offer complete experimental apparatus that are suitable for displaying a donors plaque, http://teachspin.com/index.html).

Awards and Scholarships

Eivind Horvik Memorial Award

A cash award of $100 plus a recognition plaque for the best overall performance in the calculus-based physics sequence. The recipient's name is recorded on a permanent plaque in the Physics Department office. Funds are provided by friends and associates of Eivind Horvick.

Sinha Family Scholarship

Initial funds to support this endowment in the amount of $5,000 were provided by Dr. and Mrs. Mahendra K. Sinha in memory of Mr. and Mrs. Pratap Narain, the parents of Dr. Mahendra K. Sinha, Emeritus Professor of Physics. It is understood that the recipient of this award will meet the following preferred criteria:

- Be properly enrolled at North Dakota State University at the time of application and disbursement.
- Be a Physics major with Junior or Senior standing.

Special consideration should be given by the selection committee to the applicant's academic merit and financial need.

Physics Scholarship Fund

The purpose of this endowment is to provide funding for scholarships to deserving undergraduate students.

_____

2008 Award Winners

Sinha Family Scholarship
Filipe Betzel
Jason Grimm

Eivind Horvik Memorial Award
Liisa Locker
Elliott Johnson

The Department of Physics wishes to thank all donors who have contributed to our scholarship programs. You are making a significant difference in the lives of our students

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We would like to express particular thanks to the Sinha family for their continuing generous support for the Sinha Family Scholarship

Your continued financial support is requested to keep the scholarship and awards programs growing

Enclosed is my gift of $ _____.

Please detach and mail with your gift to:
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Thank you!

Current Status of Federal Funding for Physical Science Research

Federal investments in basic and applied research by agencies such as DOE, NSF, NASA, DOD and NIST are indispensable to the vitality of our nation's research programs in physics and the physical sciences. In late 2005, the National Academies issued a report entitled "Rising Above the Gathering Storm", which lays out 20 specific actions the federal government should take to ensure America's economic leadership and ability to compete in the 21st century. The Executive Summary can be found at http://www.nap.edu/execsumm_pdf/11463.pdf. In response, the President introduced the "American Competitiveness Initiative" (http://www.whitehouse.gov/stateoftheunion/2006/aci/), which promised to dramatically increase federal funding for these agencies. The President's letter states

"To build on our successes and remain a leader in science and technology, I am pleased to announce the American Competitiveness Initiative. The American Competitiveness Initiative commits $5.9 billion in FY 2007 to increase investments in research and development, strengthen education, and encourage entrepreneurship. Over 10 years, the Initiative commits $50 billion to increase funding for research and $86 billion for research and development tax incentives. Federal investment in research and development has proved critical to keeping America's economy strong by generating knowledge and tools upon which new technologies are developed. My 2007 Budget requests $137 billion for Federal research and development, an increase of more than 50 percent over 2001 levels. Much of this increased Federal funding has gone toward biomedical research and advanced security technologies, enabling us to improve the health of our citizens and enhance national security. We know that as other countries build their economies and become more technologically advanced, America will face a new set of challenges. To ensure our continued leadership in the world, I am committed to building on our record of results with new investments—especially in the fields of physical sciences and engineering. Advances in these areas will generate scientific and technological discoveries for decades to come."

Unfortunately, recent spending bills have not always kept pace with this goal. In particular, the FY08 budget has the potential for causing irreparable harm to science (http://www.aps.org/publications/capitolhillquarterly/200802/fy08.cfm). In an April 4 letter to Department Chairs, the president of the American Physical Society states that "in the next few weeks, it is likely that the President will propose and Congress will pass an emergency supplemental funding bill for the current fiscal year. The devastating cuts to science, which have resulted in 10% fewer NSF grants and hundreds of layoffs at the national labs, could be mitigated through corrective action attached to this bill. It is unlikely these cuts will otherwise be addressed until fiscal year 2009, which is likely to start many months late due to the presidential election cycle."

In North Dakota we are lucky to have an influential congressional delegation that has shown strong support for research funding and science at NDSU. Many members of Congress in other states have not been so supportive. In view of the current fiscal situation, it is essential that you let your Members of Congress know how you feel about this issue. The following link (http://www.aps.org/policy/grassroots/), which specifically addresses the emergency supplemental funding bill, will help you get started. Your active support on this issue is essential if the goals of the American Competitiveness Initiative are to be achieved.

Undergraduate Life

Although some aspects of an undergraduate physics major's life have remained the same over the years---you still have to learn the physics, do the homework, and write lab reports---there are many opportunities that earlier generations of students did not have. One of these is the large number of Research Experience for Undergraduates programs that are offered each summer. They provide undergraduates with an opportunity to perform research in just about every area of the physical and biological sciences, at universities as well as large Federal research laboratories, while providing sufficient support to eliminate the need for an additional summer job. These programs offer students a much broader perspective than they could obtain in their home department. An ever-increasing percentage of our undergraduates are participating in these programs. The first contribution, by Elliott Johnson, provides his perspective on an REU. Another rather new opportunity for our undergraduates is the GraSUS-II program. GraSUS-II is a National Science Foundation funded project that supports Graduate Teaching Fellows in K-12 Education. In the GraSUS-II project, undergraduate and graduate students (Fellows) are placed in schools throughout the Fargo-Moorhead area. They work with science or math teachers to develop and implement curricular projects that enhance the experiences of classroom students. The second contribution, by Mason Swanson, describes his experience as a GraSUS-II Fellow. Finally, we can't pass up the opportunity to let you know that there are (although probably not many) physicists that can dance. In particular, one of our undergraduate Physics majors, Liisa Locker, is both an excellent student *and* an accomplished ballerina. In the last contribution, Liisa describes her unique (and hectic) life.

Research Experience for Undergraduates (Elliott Johnson)

Students majoring in the physical sciences are often interested in research being conducted outside their own university. Fortunately for today's students, a large number of programs are available that allow undergraduates to spend their summer participating in exciting research projects all around the country.

In the summer of 2007, I worked as an undergraduate research assistant at Stanford Linear Accelerator Center in Menlo Park, CA. The group I was working with studies advanced acceleration—new or original techniques of accelerating particles that could replace current methods. The program that supported my work was the Student Undergraduate Laboratory Internship (SULI), which is funded by the US Dept. of Energy. About a dozen DoE labs across the US are involved with SULI, giving prospective students the opportunity to get experience in a wide array of research, from particle physics to renewable energy. Many universities nationwide participate in the Research Experience for Undergraduates (REU) program, which is NSF-funded but otherwise similar to SULI in terms of available research opportunities.

Participation in these programs isn't your average summer job—in addition to a stipend, undergraduates get the opportunity to be involved with research they otherwise may not be exposed to, network with many students, faculty, and scientists from all over the US, and add some serious work experience to their resume in preparation for graduate school or entering the work force after graduation.

Most importantly, these programs raise interest and excitement in science, and provide the tools necessary to get undergraduates started in a career in scientific research and innovation. For me, experience with accelerator physics through SULI ultimately lead to entering a graduate

program in this exciting area of physics—a field with which I couldn't have otherwise been introduced during my undergraduate work at NDSU.

GraSUS -II
Graduate Teaching in K-12 Education
(Mason Swanson)

As an undergraduate student, one of the goals in having a complete university experience is being able to find employment in your area of study that is both interesting and helps enhance your education in some unique way. Over the past year, I have had the opportunity to participate in such a program: the NDSU Graduate-Student-University-School (GraSUS) Collaborative for Science, Mathematics, Engineering, and Technology. This program pairs NDSU graduate and undergraduate students (GraSUS fellows) with teachers in local high school and middle school classrooms. These students then help their partner teachers to develop and implement projects that enhance the experience of the high school students.

The *GraSUS* program is supported by a National Science Foundation grant and is in its ninth year at NDSU. The program supports approximately 12 students each year; since *GraSUS* focuses on high school science and mathematics classrooms, these students mainly have science, math, and engineering backgrounds. The program attracts both students who are pursuing careers in high school education and those who are not (myself included). Each *GraSUS* fellowship is for one year, with undergraduate fellows required to spend at least 10 hours a week in the classroom and graduate fellows required to be on-site for 20 hours a week.

For my *GraSUS* fellowship, I was paired with a high school math teacher in Fargo. During this time I have worked with her in three of her classes: Algebra I, Algebra II, and Advanced Math (senior level math). While on-site at the high school, I spend most of my time doing small things in the classroom (answering student questions, creating worksheets/review questions, etc.), but we have also tried to develop more extensive projects to engage the students and enhance their learning. One of the main goals of the *GraSUS* program is to develop these activities as a way of giving the students a deeper understanding and appreciation of their subjects. In particular, in the math classroom, one of our main goals this year has been to develop activities that demonstrate the real-world applications of mathematics. Some of the activities we have presented this year have included recreating a car accident, modeling the spread of infectious diseases, and modeling periodic motion of everyday objects.

This program has given me the unique opportunity to relive my high school experience on the other side of the classroom. Since I don't intend to pursue a career in high school education, this is an opportunity that would otherwise have been unavailable to me, and I have been lucky to have had a chance to experience this different perspective. Over the past year, I have developed a deeper appreciation of the difficulties associated with teaching and have had the opportunity to improve my skill at communicating new ideas to people. The high school setting is a great place to see the difference between *knowing* a concept and being able to *explain* that same concept to someone who has never seen it, and exposure to this frustrating distinction is often complemented by the reward of exploring possible explanations and finding one that communicates with the students. It's this exposure that has made participation in the *GraSUS* program a very unique and rewarding aspect of my undergraduate experience.

Physics and Ballet
(Liisa Locker)

It is unusual for a physics major to also do classical ballet, but I cannot imagine my life without either. My love of ballet started a decade before I became involved with physics; I took my first class when I was 5, and by middle school I was dancing four or five days per week. In high school, I was dancing six or seven days per week and intended to find a company position right after graduation. I took honors physics my junior year, then AP mechanics and E&M my senior year. By then, I was totally hooked. Now, I still dance six or seven days every week, but I'm also pursuing degrees in math and physics. Granted, that means that I get little sleep, I'm sore nearly constantly, and I often have less time than I would hope to do my homework and make lesson plans for my dance classes, but I don't think I could stand to give up either pursuit.

There isn't much overlap in the knowledge needed to do classical ballet and to do physics. You don't need to know anything about rotational inertia to know that you spin faster when your leg is held close to your body than extended away, and that when you turn faster, you're more stable on your pointe shoe. Often, though, my knowledge of mechanics helps when I teach, since I don't get the intuitive feeling of each dancer's movement, but I can usually figure out what external force is throwing them off equilibrium, and apply certain aspects of ballet technique to remedy their movement. And then there's the issue of inspiration; in high school, I choreographed an entire piece based on the field and equipotential lines of some imaginary point charges in the dance space. After that experience, I find that I can get choreographic inspiration from many of the equations I encounter in math and physics. Dance has contributed to my schooling in a more subtle way. To improve technique, a dancer has to be able to correct herself; teachers can help, but the main effort has to come from the dancer. She's the one repeating the troublesome exercise hundreds of times every week, and she's the only one with the ability to critically examine it each time it is repeated. After more than a decade practicing this self-inspection and effort, I've gained a focus that no other pursuit could have given.

Thai student visits department for year

This year the department has had the honor of hosting Waipot Ngamsaad, a doctoral candidate of the Department of Physics, Faculty of Science, Mahidol University, Thailand. Waipot Ngamsaad is a student under the Development and Promotion of Science and Technology Talents Project (DPST) which is jointly administered by Thailand's Ministry of Science and Technology, the Ministry of Education, and the Institute for the Promotion of Teaching Science and Technology. The DPST Project provides him with expenses for the duration of his visit. During his tenure at NDSU, Waipot is working with Dr. Alexander Wagner. The following contribution describes his experience in his own words.

Traveling to do research in the United States is such a great chance for a Thai student. I am a Ph.D. student at the Department of Physics, Faculty of Science, Mahidol University, in Thailand, a developing country in South-east Asia. My country is also known as the "land of smiles''. The people in Thailand are friendly and we always smile to each other easily. I was granted the support from my government to conduct research aboard for one year. They gave me the freedom to select a university in any developed country with a professor who has a research topic related to my thesis

proposal. After searching, I found the group of Dr. Alexander Wagner at Department of Physics, North Dakota State University, where I could work on lattice Boltzmann methods applied to biological systems. I decided to travel to Fargo, North Dakota State to join his research group as a visiting student. It is such a great opportunity for a student in a developing country to do research with an expert physicist. Many Universities in Thailand also have the Ph.D. program in Physics. We can study the basic Physics in the classes such as Classical Mechanics, Quantum Mechanics, Electrodynamics, Mathematical Physics and Thermodynamics and Statistical Mechanics in such a standard way. However, finding a particular research topic for the thesis is not so easy in Thailand. In my country there are only a small number of scientists, especially the physicist. If we want to conduct research in a contemporary topic, like the lattice Boltzmann method, it is quite difficult to find an expert scientist in that field who can advise the student. I must accept that my country is not advance in science and technology. Thailand is an agricultural country. So far, we did not concern in science and technology. We used to be proud of our natural resources. Because these resources are depleting every day, we concern ourselves with science and technology now. It is needed to increase the number of the skillful scientists in my country as soon as possible, in my opinion. Traveling to do the research works with NDSU should be the benefit for me and my country.

Living in Fargo is fantastic for me. It is such a peaceful city. The weather in my country and in Fargo is different. Thailand is in tropical zones so weather is hot. We have only three seasons, summer, rainy and winter, in Thailand. It has never snow before in winter. This is my first snowfall in Fargo. The temperature in Fargo is amazing to me. Someday, it is less than -20° Celsius. I have never thought that a human can survive in the temperatures below zero. People in Fargo are very friendly. They always smile and say greeting to each other everywhere. I learn new things every day in Fargo. Finally, I would like to thank the Development and Promotion of Science and Technology Project (DPST) and Department of Physics, North Dakota State University for these research opportunities.

Professor Charles L. Swisher Dept Chair from 1924 to 1946

From the birth of quantum mechanics, through the Great Depression and the Second World War, to the advent of the atomic age, Professor Charles L. Swisher guided the Department of Physics from 1924 to 1946. A contemporary of Albert Einstein, Charles Swisher was born on January 27, 1880, in Iriquois County, IL. Growing up on a farm, he attended a small country school - more regularly in the winter months, outside of the growing season. He graduated from the University of Illinois in 1909 with a Bachelor of Science degree and from the University of Michigan in 1913 with a Master's in Physics. After teaching for several years at Grinnell College in Iowa, he continued his studies at Cornell University in Ithaca, NY, where he earned his Ph.D. in Physics in 1916. Before joining NDSU (at the time, still NDAC), Dr. Swisher served as head of Physics at the South Dakota State School of Mines in Rapid City, SD, at Vanderbilt University in Nashville, TN, and at Aberdeen State Teacher College in South Dakota. Data from his research on the electrical properties of metallic calcium appeared for many years in the Physicist's and Chemist's Handbook. In August, 1910, he married Jessie Sibbitt. Together they raised a son, Capt. Forrest M. Swisher, and two daughters, Mrs. Ruth Poitz and Mrs. Loretta Arneson of Park Rapids, MN. Time will yet tell whether any of Charles Swisher's many grandchildren, great-grandchildren, and later descendants will carry onward the physics torch.

Alumni Letters

In response to last year's newsletter, we received letters from two Department alumni:

Many thanks for including me on the mailing list for the NDSU Physics Department's Spring '07 Newsletter. I really appreciated it. It was great to hear how the Department is advancing, and to get to know the new faces there a little.

It's very hard to believe that it's been 30+ years since I graduated from there with my physics degree. Gary Withnell and I were classmates.....1974.

Since then, I've spent some time working in physics overseas, at national labs, in industry, and (for the past 20 or so years) here at the University of Virginia. At present most of my work is in medical physics, measurements science, and thermal metrology, although I still dabble a little in gravitation and general relativity. I have co-founded a couple of companies, one of which now markets our FDA-approved magnetic guidance system for navigating catheters within the body. That one is named Stereotaxis, Inc., and it's presently headquartered in St. Louis, MO (NASDAQ: STXS). I find the entrepreneurial side of science and technology as interesting as the basic research these days.

If you know how to reach him, please pass it along to Ghazi Hassoun who was one of my favorite teachers there from the old days. I kindly thank you for including me on the mailing list, and please keep me on it for additional newsletters, as well.

All the best,

George T. Gillies
Research Professor, School of Engineering and Applied Science, U.Va.
Clinical Professor, Department of Neurosurgery, VCU

Thanks for sending the Physics Dept. newsletter. I enjoyed reading about departmental activities, although it has been 40+ years since I took classes in South Engineering, with Eivind Horvik as one of my professors. As requested in the newsletter, I am attaching [see Almuni News] a summary of my professional activities over the past 40+ years, since I left NDSU.

Best regards,
Professor Darrell F. Strobel
The Johns Hopkins University
Department of Earth and Planetary Sciences
3400 N Charles Street
Baltimore, MD 21218-2687

Alumni News

Jay Ihry (B.S. 2003) is a graduate student at the University of North Carolina at Chapel Hill. He is a member of the UNC String Theory group and expects to complete his PhD on deformed Yangian generators next year

Darrell F. Strobel (B.S. 1964) has been Professor in the Department of Earth and Planetary Sciences of The Johns Hopkins University since 1984, and also has a joint appointment as Professor in the Department of Physics and Astronomy and is on the Principal Research Staff of Hopkins' Applied Physics Laboratory. He earned his B. S. Physics with honors in 1964 at NDSU, an A. M. (1965) and a Ph. D. (1969) in Applied Physics from Harvard University. In 1968 he joined the Planetary Science Division at the Kitt Peak National Observatory in Tucson where his main research was theoretical studies of planetary atmospheres and terrestrial aeronomy. In 1973 he moved to the Naval Research Laboratory's Plasma Physics Division as a research physicist responsible for theoretical studies of the earth's atmosphere, while continuing research in planetary atmospheres/astrophysics.

Professor Strobel spent most of his career involved in the US space program, starting as a Co-Investigator and the Science Team Leader of the Ultraviolet Spectrometer Experiment on the Voyager Mission (1973-1991). In 1983, Prof. Strobel was a member of the Outer Planets Study Team of the NAS-ESF Joint Working Group on Planetary Exploration, who constructed plans for the Cassini-Huygens Mission and wrote its science objectives; he is now the Cassini Orbiter Interdisciplinary Scientist for Aeronomy and Solar Wind Interaction. The Cassini spacecraft, launched in October 1997, arrived at Saturn July 2004 and hopefully will be returning data until at least 2011. He is also a Co-Investigator on the New Horizons Pluto Kuiper-belt Mission, which was successfully launched on January 19, 2006 and will arrive at Pluto in July 2015. With colleagues in the Hopkins Physics and Astronomy Department, he has used the Hubble Space Telescope to study the atmospheres of Jupiter and its Galilean satellites and the Io plasma torus. Observations have led to the discovery of oxygen atmospheres on Europa and Ganymede.

Prof. Strobel is a member of the American Astronomical Society - Division of Planetary Sciences, a fellow of the American Geophysical Union, and member of the International Astronomical Union. He served as an Associate Editor, Journal of Geophysical Research, 1976-1979, Space Physics section; 1982-1984, Atmospheres section; Associate Editor, Icarus, 1980-2006, and currently on the Editorial Board; on the Committee on Solar and Space Physics, SSB, National Academy of Sciences (NAS), 1982-1985, the Space Science Board (SSB), 1985-1988, the Space Studies Board, 1988-1989, on the Committee on Planetary and Lunar Exploration (COMPLEX), SSB, 1992-1996, on the Committee on International Programs, SSB, 1996-1998, and is currently on COMPLEX for a second term. He is the author of approximately 165 journal publications and 17 book chapters.

Paul L. Juell, computer scientist and physicist, passed away at Meritcare Hospital in Fargo on Dec. 29, 2007, after a courageous battle with cancer. Paul Juell was born on August 26, 1945, in Lusk, WY. He graduated from NDSU in 1968 with a Bachelor of Science degree, majoring in Physics, and from Rensselear Polytechnic Institute in 1972 with a Master of Science degree. After working as a computer programmer, he earned his Ph.D. in Computer Science in 1981 from the Ohio State University. In 1982, he returned to NDSU, joining the faculty of the newly formed Department of Computer Science and Operations Research. His broad research interests in Artificial Intelligence and Technology-Based Teaching took him around the world, including trips to China, Egypt, Italy, and Morocco. A dedicated teacher, he served as major advisor to over 127 graduate students during the course of his 25-year career at NDSU. His lasting influence on students was recognized this year by his posthumous receipt of the first ever college of Science and Mathematics Award for Excellence in mentoring. Paul Juell is survived by his wife, Carolyn, four foster sons, and five foster grandchildren.

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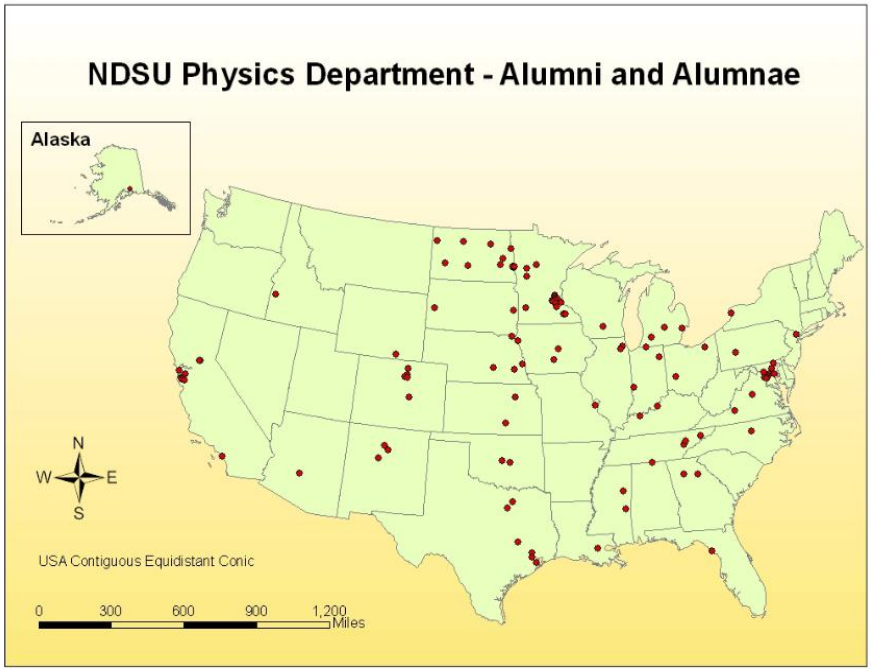

NDSU graduates from the Physics Department are scattered throughout the United States and across the globe. We are eager to hear from our alums. Please send an email or note to update us on what's happening in your world.
patty.hartsoch@ndsu.edu